

WHAT IS CLAIMED IS:

1                   1.       A torsion module of a torque detection device for a steering  
2   system of a motor vehicle, the torsion module comprising:  
3                   a first ring attachable to a steering wheel;  
4                   a second ring;  
5                   a spoked wheel attached on a top side to the first ring and attached  
6   on a bottom side to the second ring, the spoked wheel having a hub, a rim, and  
7   bending spokes which join the rim to the hub, the bending spokes being bendable  
8   in the event of a rotation angle offset between the hub and the rim in response to a  
9   torque applied to the steering wheel; and  
10                  a measuring sensor placed on at least one of the bending spokes, the  
11   measuring sensor being operable for generating a signal as a function of a bending  
12   force experienced by the at least one of the bending spokes as the at least one of the  
13   bending spokes bends in response to a rotation angle offset between the hub and the  
14   rim;  
15                  the spoked wheel further having bending-resistant limit stop spokes  
16   placed alternately between the bending spokes, each bending-resistant limit stop  
17   spoke having a free end that protrudes radially from the hub towards the rim, the  
18   free ends of the bending-resistant limit stop spokes being engaged with respective  
19   regions of the rim in such a manner as to permit a rotational angle offset between  
20   the hub and the rim while limiting the maximum rotation angle offset between the  
21   hub and the rim;  
22                  the hub, the rim, the bending spokes, and the bending-resistant limit  
23   stop spokes of the spoked wheel being concentric to one another;  
24                  the first and second rings having inward-pointing projections adjacent  
25   to the regions of the rim engaged with the bending-resistant limit stop spokes to  
26   form axially separated limit stops which enclose the free ends of the bending-  
27   resistant limit stop spokes on the top and bottom sides of the spoked wheel in order  
28   to prevent axial movement between the hub and the rim.

1                   2.       The torsion module of claim 1 wherein:  
2                   the measuring sensors include strip strain gauges.

- 1                    3.        The torsion module of claim 2 wherein:  
2                    the strip strain gauges are placed on different sides of different ones  
3 of the bending spokes.
- 1                    4.        The torsion module of claim 1 wherein:  
2                    the rim and the bending-resistant limit stop spokes are placed such  
3 that they are located in one plane and have the same extent in the axial direction.
- 1                    5.        The torsion module of claim 4 wherein:  
2                    the first ring is a spacer ring.
- 1                    6.        The torsion module of claim 4 wherein:  
2                    the second ring is part of a base plate of the steering wheel.
- 1                    7.        The torsion module of claim 1 wherein:  
2                    each region of the rim engaged with a free end of a bending-resistant  
3 limit stop spoke includes a limit stop arrangement having two bulges that project  
4 inward from the rim.
- 1                    8.        The torsion module of claim 7 wherein:  
2                    the bulges of each limit stop arrangement are separated at a distance  
3 from each other leaving a limit stop gap.
- 1                    9.        The torsion module of claim 1 wherein:  
2                    the spoked wheel is insertable into a recess of the steering wheel, the  
3 recess having an inward-directed projection forming a torque support which  
4 positively engages into the rim of the spoked wheel.